

WHAT IS CLAIMED IS:

1. A method for downloading and displaying a program using a mobile terminal in an interworking environment that includes a first radio access network having a first data transfer rate and a second radio access network having a second data transfer rate that is faster than the first data transfer rate, the method comprising the steps of:

downloading, via the first or second radio access networks, a layer of a program encoded into multiple layers, the program being downloaded at the second data transfer rate when the mobile terminal is in the coverage area of the second radio access network;

displaying the downloaded video program at a playback rate that corresponds to a display quality;

buffering excess portions of the downloaded program that result when a rate at which the video program is being downloaded exceeds a rate at which the video program is displayed; and

increasing the number of layers being downloaded, and the playback rate at which the video program is displayed to thereby increase the display quality, when the buffered excess portions of the downloaded program exceeds a threshold level.

2. The method of claim 1, wherein the threshold level corresponds to a time duration of a remainder of the program to be played back multiplied by a difference between a current playback rate and the first data transfer rate.

3. The method of claim 1, wherein the increasing step comprises the step of limiting the playback rate to a maximum value that is equal to a sum of the first data transfer rate and a quotient resulting from dividing the buffered excess portions of the downloaded program by a time duration of the remainder of the program to be played back.

4. The method of claim 1, wherein the increasing step comprises increasing the playback rate by an amount that corresponds to the number of layers being downloaded, such that each additional layer being downloaded results in an incremental change to the playback rate.

5        5.        The method of claim 1, further comprising the step of continuing to download the program from the first radio access network while maintaining a last playback rate from the second radio access network for a duration of playing back the program, when the mobile terminal is again within the coverage area of the first radio access network.

10       6.        The method of claim 1, further comprising the step of maintaining a last playback rate from the second radio access network for a duration of playing back the layered media, when the mobile terminal is again within the coverage area of the first radio access network and the entire program has been completely downloaded.

15       7.        The method of claim 1, wherein the increasing step comprises the step of transmitting to a source of the program a request to increase the number of layers being transmitted.

20       8.        The method of claim 1, wherein the first radio access network is a 3G network and the second radio access network is a Wireless Local Area Network (WLAN).

25       9.        A mobile terminal for downloading and displaying a program in an interworking environment that includes a first radio access network having a first data transfer rate and a second radio access network having a second data transfer rate that is faster than the first data transfer rate, the mobile terminal comprising:

      a receiver for downloading, via the first or second radio access networks, a layer of a program encoded into multiple layers, the program being downloaded at the faster data transfer rate when the mobile terminal is in the coverage area of the second radio access network;

30        a display for displaying the downloaded video program at a playback rate that corresponds to a display quality;

      a memory device for buffering excess portions of the downloaded program that result when a rate at which the program is being downloaded exceeds a rate at which the video program is displayed; and

a processor, coupled to the receiver, display and memory device, for increasing the number of layers being downloaded, and the playback rate at which the program is displayed to increase the display quality, when the buffered excess portions of the downloaded program exceeds a threshold level.

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10. The mobile terminal of claim 9, wherein the threshold level corresponds to a time duration of a remainder of the video program to be played back multiplied by a difference between the playback rate and the first data transfer rate.

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11. The mobile terminal of claim 9, wherein the processor limits the playback rate to a maximum value that is equal to a sum of the first data transfer rate and a quotient resulting from dividing the buffered excess portions of the downloaded program by a time duration of the remainder of the program to be played back.

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12. The mobile terminal of claim 9, wherein the processor increases the playback rate by an amount that corresponds to a number of layers being downloaded, such that each additional layer being downloaded results in an incremental change to the playback rate.

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13. The mobile terminal of claim 9, wherein the receiver continues to download the program from the first radio access network while the processor maintains a last playback rate from the second radio access network for a duration of playing back the program, when the mobile terminal is again within a coverage area of the first radio access network.

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14. The mobile terminal of claim 9, wherein the processor maintains a last playback rate from the second radio access network for a duration of playing back the layered media, when the mobile terminal is again within a coverage area of the first radio access network and the program has been completely downloaded.

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15. The mobile terminal of claim 9, further comprising a transmitter for transmitting to a source of the program a request to increase the number of layers being transmitted, in respond to a command issued by the processor.

16. The mobile terminal of claim 10, wherein the first radio access network is a 3G cellular network and the second radio access network is a Wireless Local Area Network (WLAN).

5 17. A method for downloading and displaying a program using a mobile device in an interworking environment that includes a first radio access network having a first data transfer rate and a second radio access network having a second data transfer rate that is faster than the first data transfer rate, the method comprising the steps of:

10 downloading, via the first or second radio access networks, a layer of a video program encoded into multiple layers, the video program being downloaded at the faster data transfer rate when the mobile terminal is in the coverage area of the second radio access network;

15 displaying the downloaded video program at a playback rate that corresponds to a display quality;

downloading a current layer and a next layer of the video program at the same time when the mobile terminal enters the coverage area of the second radio access network; and

20 increasing the playback rate at which the video program is displayed to increase the display quality; when the next layer has been completely downloaded.

18. The method of claim 17, wherein the multiple layers comprise a base layer and at least one subsequent layer, each of the at least one subsequent layer being associated with an incremental change to the playback rate, and wherein said  
25 increasing step increases the playback rate by an amount that corresponds to the next layer.

19. The method of claim 17, further comprising the step of continuing to  
30 download the video program from the first radio access network while maintaining a last playback rate from the second radio access network for a duration of playing back the video program, when the mobile terminal is again within the coverage area of the first radio access network.

20. The method of claim 17, further comprising the step of maintaining a last playback rate from the second radio access network for a duration of playing back the layered media, when the mobile terminal is again within the coverage area of the first radio access network and the entire video program has been completely downloaded.

21. The method of claim 17, wherein the second downloading step comprises downloading the next layer starting from a current playback point.

22. The method of claim 19, wherein the first radio access network is a 3G cellular network and the second radio access network is a Wireless Local Area Network (WLAN).

23. A mobile terminal for downloading and displaying a video program in an interworking environment that includes a first radio access network having a first data transfer rate and a second radio access network having a second data transfer rate that is faster than the first data transfer rate, the mobile terminal comprising:

a receiver for downloading, via the first or second radio access networks, a layer of a video program encoded into multiple layers, the video program being downloaded at the faster data transfer rate when the mobile terminal is in the coverage area of the second radio access network, the receiver downloading a current layer and a next layer of the video program at the same time when the mobile terminal enters the coverage area of the second radio access network even if a preceding layer of the video program is still being downloaded;

a display for displaying the downloaded video program at a playback rate that corresponds to a display quality; and

a processor, coupled to the receiver, and display, for increasing the playback rate at which the video program is displayed to thereby increase the display quality when the next layer has been completely downloaded.

24. The mobile terminal of claim 23, wherein the multiple layers comprise a base layer and at least one subsequent layer, each of the at least one subsequent layer being associated with an incremental change to the playback rate, and wherein

the display increases the playback rate by an amount that corresponds to the next layer.

25. The mobile terminal of claim 23, wherein the processor maintains a last  
5 playback rate from the second radio access network for a duration of playing back the video program, when the mobile terminal is again within a coverage area of the first radio access network.

26. The mobile terminal of claim 23, wherein the processor maintains a last  
10 playback rate from the second radio access network for a duration of playing back the layered media, when the mobile terminal is again within a coverage area of the first radio access network and the entire video program has been completely downloaded.

27. The mobile terminal of claim 23, wherein the receiver downloads the  
15 next layer of the video program starting from a current playback point.

28. The mobile terminal of claim 23, wherein the first radio access network  
is a 3G cellular network and the second radio access network is a Wireless Local  
Area Network (WLAN).